

REMARKS

This application has been reviewed in light of the Office Action dated February 5, 2003. Claims 1-10 and 16-25 are presented for examination. Claims 11-15 have been cancelled, without prejudice or disclaimer of subject matter. Claims 1, 10, 16, 17, and 18 have been amended to define more clearly what Applicant regards as his invention, and Claims 2 and 3 have been amended to insert a comma after "Claim 1". At least the latter amendments have not been made for purposes related to patentability, and no change in claim scope is either intended or believed effected by those changes. Claims 20-25 have been added to provide Applicant with a more complete scope of protection. Claims 1, 10, and 20 are in independent form. Favorable reconsideration is requested.

Claims 1 and 6-9 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,872,541 (Yoshioka et al.), and Claims 2-5 were rejected under 35 U.S.C. § 103(a) as being obvious over Yoshioka et al. in view of U.S. Patent No. 6,135,839 (Iwase et al.). Claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as being obvious over Yoshioka et al. in view of U.S. Patent No. 6,400,091 (Deguchi et al.). Claims 10-15 were rejected under 35 U.S.C. § 103(a) as being obvious over Deguchi et al. Claims 16-19 were rejected under 35 U.S.C. § 103(a) as being obvious over Deguchi et al. in view of Iwase et al.

As amended, independent Claim 1 is directed to an electron-emitting apparatus comprising an electron-emitting device including a first electrode, a second electrode that is provided so as to be insulated from the first electrode, and an electron-emitting film electrically connected to the second electrode. The apparatus also comprises

an anode provided at a predetermined distance from the electron-emitting film. The first electrode, the second electrode, and the electron-emitting film oppose the anode, and a distance between the anode and the electron-emitting film is longer than a distance between the anode and the second electrode. Also, a distance between the anode and the first electrode is longer than the distance between the anode and the electron-emitting film.

A notable feature of Claim 1 is that the electron-emitting film is electrically connected to the second electrode. Support for this feature is provided in the specification and drawings as originally filed, including without limitation Fig. 1, which shows an electron emitting film (15) connected to a second electrode (14). An electron is supplied from the second electrode (14) to the electron emitting film (15). Of course, Fig. 1 is referred to herein for purposes of illustration only, and the subject matter of Claim 1 should not be construed as being limited only to the specific embodiment shown in Fig. 1.

Fig. 36 of Yoshioka et al., cited in the Office Action, depicts an electron emission device in which a Pd vapor-deposited film serving as an electron-emitting layer 3a is disposed in an insulating layer 5 containing electron-emitting materials 9 as Pd fine particles, a stepped portion, and electron-emitting bodies 3b provided on a sidewall of the stepped portion by coating an organic palladium solution followed by baking.

In paragraph 3, lines 3-4, the Office Action states that “an electron emitting film (3a) [is] connected to the second electrode via the insulating layer (5).” However, Applicant submits that the film 3a of Yoshioka et al. is insulated from the second electrode by the insulating layer 5.

In the apparatus of Claim 1, on the other hand, the electron-emitting film is directly *electrically connected* to the second electrode. (See, e.g., Fig. 1). Nothing in Yoshioka et al. would teach or suggest those features in the context of an apparatus as defined in Claim 1. Accordingly, Claim 1 is believed clearly patentable over that reference.

Independent Claim 10, as amended, is directed to an electron-emitting device comprising a first electrode arranged on a surface of a substrate, an insulating layer arranged on the first electrode, and a second electrode arranged on the insulating layer. The device also comprises a film comprising fibers including carbon as a main ingredient arranged on the second electrode, each fiber including graphens stacked along an axial direction of the fiber. The second electrode has two side surfaces that oppose each other in a direction substantially parallel to the surface of the substrate, and the electron-emitting film is arranged so as to be shifted close to one of the two side surfaces.

Deguchi et al. relates to an electron emitting element comprising a substrate, a cathode formed on the substrate, and anode opposed to the cathode, an electron emission member disposed on the cathode, and a control electrode disposed between the cathode and the anode.

<sup>¶</sup> Paragraph 10 of the Office Action states that Fig. 1A of Deguchi discloses “a first electrode (12) arranged on a surface of a substrate (11), an insulating layer (16) arranged on the first electrode, a second electrode (15) arranged on the insulating layer, and an electron emitting film (14) arranged on the second electrode.” However, in Applicant’s view, in Fig. 1A of Deguchi et al. the insulating layer (16) is disposed on a substrate (11), not on the first electrode (12), and the electron emitting film (14) is disposed on the first

electrode 12. Nothing has been found, or pointed out, in Deguchi et al. that would teach or suggest a first electrode arranged on a surface of a substrate, an insulating layer arranged on the first electrode, a second electrode arranged on the insulating layer, and a film comprising fibers, containing carbon as a main ingredient, arranged on the second electrode, as recited in Claim 10.

Accordingly, Claim 10 is deemed clearly patentable over Deguchi et al.

Added Claim 20 is directed to an electron emitting-apparatus comprising a first electrode arranged on a surface of a substrate, an insulating layer arranged on the first electrode, a second electrode arranged on the insulating layer, a film comprising fibers, including carbon as a main ingredient, arranged on the second electrode, and an anode disposed at a distance from the film, the first electrode, the insulating layer, the second electrode, and the substrate. A first power source applies a necessary electric field, to cause an electron emission from the fibers, between the anode and a cathode. A second power source applies a necessary electric field to stop the electron emission from the fibers, between the first electrode and the second electrode.

Yoshioka et al. and Deguchi et al. were discussed above. Applicant respectfully submits that nothing in either of those references would teach or suggest an electron emitting-apparatus having features as recited in Claim 20, including at least those ones underlined above.

A review of the other references relied on in the Office Action has not revealed anything which, in Applicant's opinion, would remedy the above-noted deficiencies

of Yoshioka et al. and Deguchi et al. as references against the independent claims herein.

Accordingly, the independent claims are believed patentable over those references as well.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

  
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